Gender Differences in Eating Disorder Symptoms in Young Adults

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Abstract: **Objective:** *The major goal of this study was to identify problematic eating behaviors and attitudes in young men and compare them with those of young women.* **Method:** *A community sample of young adults ($n = 1,056$) completed a questionnaire that contained the Drive for Thinness, Bulimia, and Body Dissatisfaction subscales of the Eating Disorder Inventory, as well as probes for inappropriate compensatory behaviors, excessive exercise, and episodes of binge eating.* **Results:** *A five-factor structure fit both male and female samples. Women had substantially elevated scores on all of the factors except excessive exercise, for which men had significantly higher scores. The absolute proportion of men and women wanting or having sought treatment was very low. However, at comparable levels of problematic eating behaviors, women were more likely to have sought treatment than men.* **Discussion:** *The questionnaire used in this study encompasses symptoms outlined in the Diagnostic and Statistical Manual of Mental Disorders symptoms, which should prove useful in future research.* © *2002 by Wiley Periodicals, Inc.* Int J Eat Disord 32: 426–440, 2002.

Key words: *gender differences; problematic eating behaviors; treatment*

INTRODUCTION

The eating disorders (ED) anorexia nervosa (AN) and bulimia nervosa (BN) are far more common in women than in men (Woodside et al., 2001). Most studies in the field focus exclusively on women. Consequently, considerably less is known about problematic eating behaviors among men. However, interest in eating problems among men has increased for several reasons. First, treatment centers have experienced an increase in requests for treatment by men over the past two decades (Braun, Sunday, Huang, & Halmi, 1999). In the absence of epidemiologic data over time, it is unclear whether this trend reflects a true increase in the incidence and prevalence of ED among men. Experts

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have suggested that the increase is due to improved awareness of ED among both treatment providers and men with disordered eating.

Second, the increased focus on men with ED stems from the increased interest in classification, both in terms of the number of ED to be recognized and the thresholds for defining the ED. Specifically, in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 1994), binge eating disorder (BED) was introduced as a provisional diagnosis of a disorder in need of further study. Field studies of this new diagnostic category found that among patient samples, women with BED outnumbered men only by a factor of 3:2 and that in community samples, BED was as common among men as among women (Spitzer et al., 1992, 1993).

Several influential investigators (King, 1989) have suggested that the diagnostic thresholds defined in DSM-IV (APA, 1994) for AN and BN sufferers are too high and that partial-syndrome (PS) cases should be included in studies of ED because PS-ED represents a risk to health in their own right (for a review, see Herzog & Delinsky, 2001). The few epidemiologic studies that have included men and reported on PS-ED have found that among those participants with a PS-ED, a substantial subset is male (Garfinkel et al., 1995). In the largest epidemiologic study reported to date (Garfinkel et al., 1995), women had a 10-fold greater prevalence rate of BN than men, yet the prevalence rates of men and women who reported binge eating twice or more per week were the same. Because of the well-established association among women between binge eating and other psychiatric symptoms (e.g., depression) and obesity (Striegel-Moore, Leslie, Petrill, Garvin, & Rosenhack, 2000), research is needed to determine the prevalence and clinical significance of this important behavioral symptom in men.

Third, experts have noted that the DSM-IV syndromes of AN and BN have been defined on the basis of clinical presentation of female patients (Striegel-Moore & Marcus, 1995). A major goal of the present study was to identify types of ED behaviors and attitudes that may also be problematic for men. For example, among men with AN, excessive exercise is said to be a prominent problem (Touyz, Kopec-Schrader, & Beumont, 1993). Although this symptom also is present in many women with AN, excessive exercise and its negative health outcomes have been studied far less than the more typically ''feminine'' symptoms such as over valuation of weight or fear of weight gain. Therefore, there is a gap in knowledge about the prevalence and correlates of excessive exercise. Our study addressed this gap by examining the gender-specific rates of excessive exercise and testing the hypothesis that excessive exercise is associated with a history of psychopathology and with concurrent ED symptoms. Following DSM-IV, excessive exercise was operationalized as exercising so much that it interferes with other activities and/or as exercising to the point of feeling pain or injury.

Finally, because cases of full-syndrome ED (FS-ED) are rare among both female and male populations, investigators have examined ED symptoms using dimensional rather than categorical measures (Rosen, Silberg, & Gross, 1988; Shore & Porter, 1990). As Carlat and Camargo (1991) indicated in their comprehensive review of eating problems among men, research is needed to determine the dimensional structure of these self-report instruments when used with male samples. The present study included items from each of the three core ED subscales of the Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983) along with items assessing excessive exercise and inappropriate compensatory behaviors and examined gender differences in the factor structure.

We take advantage of a dataset based on a large sample of randomly selected high school students who entered an epidemiologic study, the Oregon Adolescent Depression

Project (OADP) during the mid-1980s. The students were reexamined a year later (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993) and again during their 24th year (Lewinsohn, Rohde, Klein, & Seeley, 1999). On each of these occasions, extensive diagnostic information was collected about current and past episodes of mental disorders that included aspects of problematic eating behaviors. Lewinsohn et al. (1993) provided information about the point and lifetime prevalence of AN and BN among female and male adolescents. They also presented data on the female sample regarding (a) the epidemiology of ED through early adulthood, (b) the clinical characteristics for PS/FS-ED, and (c) the continuity between adolescent ED and young adult psychopathology (Lewinsohn, Striegel-Moore, & Seeley, 2000). In the present study, we examine and compare the relative prevalence of specific problematic eating behaviors among young adult men and women. We administered a comprehensive questionnaire measure of problematic eating behaviors to the young adult sample and considered the following issues: (1) Do women endorse more ED items overall? (2) Are there certain ED symptoms that are specifically elevated in men and others that are specifically elevated in women? (3) Is the dimensional structure of ED symptoms different among men than among women? (4) Are men with comparable levels of ED problems less likely to seek treatment than women?

METHODS

Participants and Procedures

OADP participants were selected randomly from nine senior high schools in western Oregon. A sample of 1,709 adolescents (ages 14–18) completed the initial (T_1) assessments (interview and questionnaires) between 1987 and 1989, with an overall participation rate of 61%. At the second assessment (T_2), 1,507 participants (88%) returned for a readministration of the interview and questionnaire (mean T_1–T_2 interval = 13.8 months, SD = 2.3). Differences between the sample and the larger population from which it was selected, as well as between participants and those who declined or dropped out of the study were small (additional details regarding the T_1 and T_2 assessments are provided by Lewinsohn et al., 1993).

As OADP participants reached their 24th birthday, all participants with a history of major depressive disorder (MDD; n = 360), all participants with a history of non-mood disorder (including ED; n = 284) at T_2, and a randomly selected subset of adolescents with no psychiatric diagnosis by T_2 (n = 457) were invited to participate in a T_3 interview. Of the 1,101 individuals selected for a T_3 interview, 941 young adults (86%) participated: 539 (57%) women and 402 (43%) men. The average age at T_3 was 24.2 years (SD = 0.6). Most participants were White (89%), with 1.1% Black, 3.0% Hispanic, 2.6% American Indian, 2.6% Asian, and 1.8% other. Most were single (61%), 34.1% were married, 1.6% were separated, and 2.8% were divorced. Almost all (97%) had graduated from high school and 31% had received a bachelors degree or higher. The mean time between T_2 and T_3 assessments was 6.8 years (SD = 1.4). Women were more likely than men to complete the T_3 assessments (89% vs. 81%); χ^2 (1, n = 1,101) = 13.55, $p < .001$). Differences in T_3 participation as a function of other demographics or T_2 diagnostic status were nonsignificant.

Participants who completed the T_2 assessment, and who did not subsequently decline participation in the follow-up study, were invited after their 24th birthday to participate

in a questionnaire assessment concerning their eating behavior ($n = 1{,}333$). Of those who completed the questionnaire ($n = 1{,}056$; 79%), 630 (60%) were women (mean age = 27.4; $SD = 1.5$; range = 24–32) and 749 (71%) had completed the T_3 interview (mean interval = 3.5 years, $SD = 1.6$).

Diagnostic Interviews

Participants were interviewed at T_1 with a version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982) and the Present Episode version and included additional items to derive diagnoses as outlined in the 3rd Rev. edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 1987). At T_2 and T_3, participants were interviewed using the Longitudinal Interval Follow-Up Evaluation (LIFE; Keller et al., 1987), which elicited detailed information about the course of psychiatric symptoms and disorders since the previous interview. T_3 diagnoses were made using DSM-IV criteria.

Diagnostic interviewers were carefully selected and trained. Based on a randomly selected subsample at T_1 ($n = 233$), interrater reliability for lifetime diagnoses were moderate to excellent: ED ($\kappa = .66$), bipolar disorder ($\kappa = .49$), MDD ($\kappa = .86$), anxiety disorders ($\kappa = .76$), disruptive behavior disorders ($\kappa = .83$), alcohol abuse/dependence ($\kappa = .84$), and drug abuse/dependence ($\kappa = .84$). For the T_2–T_3 period ($n = 178$), interrater reliability was moderate to excellent for ED ($\kappa = .66$), bipolar disorder ($\kappa = .74$), MDD ($\kappa = .86$), anxiety ($\kappa = .87$), alcohol abuse/dependence ($\kappa = .77$), and drug abuse/dependence ($\kappa = .94$).

PS-ED and FS-ED

Although initially designed to collect diagnostic information according to DSM-III-R criteria, enough information was collected in the T_1 and T_2 assessments to ascertain the AN and BN symptom patterns for DSM-IV criteria. PS-AN was defined as meeting DSM-IV Criterion A (i.e., refusal to maintain minimally normal body weight) plus one of the additional three symptoms (Criterion B, C, or D). PS-BN was defined as meeting DSM-IV Criterion A (i.e., recurrent episodes of binge eating) plus one of the additional three symptoms (Criterion B, C, or D).

Assessment of ED Symptoms

Drawing upon several existing instruments, a 51-item instrument (available upon request) was constructed to assess, by self-report, cognitive and behavioral symptoms of ED that occurred during the past 3 months. Questions were included to permit (a) a categorical judgement about the presence of core symptoms of FS-ED and (b) a dimensional assessment of symptom severity.

Section I: Descriptive Information

Eleven items assessed current height, current weight, lowest weight in the last 3 months, highest weight in the last 3 months, self-perceived ideal weight, attempted weight loss, last time on diet, diet plan and adherence, ever wanted treatment for eating problems, ever received treatment for an eating problem, and regularity of menstrual periods in last 3 months (women only).

Section II: Eating Disorders Symptoms Questionnaire

Thirty-two items were included in the EDSQ (see Table 1 for item list and source) to assess problematic behaviors and thoughts, which are part of the DSM-IV description of symptomatology for AN and BN. For each item, a 6-point scale was used to assess the frequency of occurrence (never, rarely, sometimes, often, usually, always) in the last 3 months. All items were coded such that high scores reflected problematic functioning. Items were derived from the following existing instruments. From the EDI (Garner, Olmsted, Bohr, & Garfinkel, 1982), the three core symptom subscales were included: Body Dissatisfaction (abbreviated to four items), Drive for Thinness (seven items), and Bulimia (seven items). In addition, seven diagnostic probes from the K-SADS were used in questionnaire form to tap body image disturbance and compensatory behaviors associated with AN and BN. One item from the Multidimensional Body Self-Relations Questionnaire (MBSRQ) and six probes from the Screening Interview for Eating Disorders (SIED; Striegel-Moore, 2001) were added to assess other DSM-IV criteria (including excessive exercise).

Section III: Objective Overeating and Binge Eating

To assess DSM-IV binge eating episodes, six yes/no questions and two open-ended questions were included. The yes/no questions asked whether the respondent (a) during the past 3 months had experienced episodes of overeating within a 2-hr period of time, (b) felt bad after binging, (c) experienced a lack of control over the overeating episodes, (d) felt upset due to lack of control, (e) thought that his/her eating habits were abnormal, and (f) averaged at least two episodes of binging per week. The two open-ended questions asked participants to describe two episodes of binge eating that occurred during the past 3 months (''Please list all the foods that you ate, including how much of these foods you ate''). Using guidelines established by Fairburn and Cooper (1993), the completed responses were reviewed and rated by two trained independent raters into one of three categories, based on the food amount described, as objectively large, subjectively large (i.e., even though the participant described the episode as one of overeating, in the expert judgement the amounts involved were insufficient to warrant a classification of overeating), or ambiguous. When the two raters disagreed, a third expert rater made the final decision. Raters were blind to the respondents' answers on any of the other eating-related questions. For analyses examining binge eating as a categorical variable, binge eating was coded as present if participants indicated that they had experienced an overeating episode, the participants indicated loss of control over the episode, and the narrative description of overeating episodes was coded by the raters as objectively large.

RESULTS

Psychometric Analysis

Dimensional Structure

To examine the dimensional structure of the 32 ED symptom items (EDSQ), the total sample was randomly split in half. Exploratory analyses were conducted on the first half followed by confirmatory analyses on the second half. The exploratory analyses included principal axis factor analysis and principal components analysis using both varimax and oblique rotations. Because the dimensional structures were similar across the various extraction and rotation techniques, only the results from the principal axis factor analysis using varimax rotation are presented. Five factors were extracted based on the scree plot

Table 1. Five-factor structure for the 32-item Eating Disorders Symptoms Questionnaire

Item		Source	Communality	Factor Loadings 1	2	3	4	5
1.	I am terrified of gaining weight.	EDI-DT	.78	.80	.20	.25	.19	.09
2.	I am preoccupied with the desire to be thin.	EDI-DT	.80	.78	.28	.27	.15	.13
3.	If I gain a pound, I worry that I will keep gaining.	EDI-DT	.75	.76	.30	.20	.22	.13
4.	I am very afraid that I could become fat.	K-SADS	.69	.76	.19	.25	.11	.09
5.	I exaggerate or magnify the importance of weight.	EDI-DT	.65	.74	.15	.20	.12	.17
6.	I feel fat even when others say I look thin.	K-SADS	.65	.71	.13	.29	.17	.05
7.	I feel extremely guilty after overeating.	EDI-DT	.71	.71	.24	.36	.13	.08
8.	I think about dieting.	EDI-DT	.66	.68	.21	.36	.14	.03
9.	I am very conscious of even small changes in my weight.	MBSRQ	.50	.66	.13	.10	.15	.09
10.	My body shape is one of the most important things that affects how I feel about myself.	SIED	.49	.62	.23	.09	.10	.16
11.	I need to be very thin in order to feel good about myself.	SIED	.50	.61	.20	.15	.19	.14
12.	Even at my lowest weight I still feel too fat.	SIED	.54	.59	.27	.30	.15	.05
13.	I can eat sweets and carbohydrates without feeling nervous.	EDI-DT	.14	.20	.07	.21	.05	.07
14.	I have gone on eating binges when I felt that I could not stop.	EDI-BU	.73	.22	.78	.07	.30	.05
15.	I think about binging (overeating).	EDI-BU	.69	.20	.73	.09	.26	.18
16.	I eat moderately in front of others and stuff myself when they are gone.	EDI-BU	.68	.18	.73	.16	.26	.15
17.	I eat or drink in secrecy.	EDI-BU	.52	.17	.61	.10	.27	.21
18.	I feel that my eating is out of control.	SIED	.53	.32	.60	.24	.09	.05
19.	I stuff myself with food.	EDI-BU	.36	.17	.57	.03	.07	.02
20.	I eat when I am upset.	EDI-BU	.41	.38	.41	.24	.08	−.15
21.	I think my thighs are just the right size.	EDI-BD	.79	.36	.09	.80	.01	−.02
22.	I like the shape of my buttocks.	EDI-BD	.68	.33	.18	.73	−.01	−.03
23.	I think my hips are too big.	EDI-BD	.63	.45	.07	.64	.08	−.07
24.	I think my stomach is just the right size.	EDI-BD	.49	.36	.16	.58	.01	.06
25.	I take laxatives to lose weight.	K-SADS	.71	.08	.19	−.01	.81	.07
26.	I use diuretics (water pills) to lose weight.	K-SADS	.49	.11	.17	.01	.66	.10
27.	I make myself throw up.	K-SADS	.51	.09	.22	−.01	.65	.18
28.	I have thought of trying to vomit in order to lose weight.	EDI-BU	.49	.28	.28	.15	.54	.12
29.	I use diet pills.	K-SADS	.36	.30	.09	.07	.50	.04
30.	I go on fasts (eating nothing but juice or water for at least 24 hours).	K-SADS	.26	.25	.14	.03	.31	.29
31.	I exercise to the point of feeling pain or injuring myself.	SIED	.54	.09	.13	−.04	.19	.69
32.	I exercise so much that it interferes with other activities.	SIED	.59	.28	.13	.01	.18	.68

Note: BD = Body Dissatisfaction; BU = Bulimia; DT = Drive for Thinness; EDI = Eating Disorder Inventory; K-SADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children; MBSRQ = Multi-dimensional Body Self-Relations Questionnaire; SIED = Screening Interview for Eating Disorders.

of the eigenvalues. After rotation, the five extracted factors accounted for 57.2% of the variance. The first factor (38.4%), Drive for Thinness, consisted of the EDI Drive for Thinness subscale items as well as K-SADS items and SIED items pertaining to body image distortion and the over valuation of thinness. The second factor (9.1%), Bulimia, included items from the EDI Bulimia subscale. The third factor, Body Dissatisfaction (4.5%), included the four items of the EDI Body Dissatisfaction subscale. The fourth factor, Inappropriate Compensatory Behaviors (3.0%), included K-SADS items pertaining to purging. The fifth factor, Excessive Exercise (2.2%), included the two items regarding exercise. Only one item, ''I can eat sweets and carbohydrates without feeling nervous,'' (EDI Drive for Thinness) did not load greater than .30 on any of the factors. This item was not retained for the confirmatory analysis.

To test whether the five-factor structure fit for the second half of the sample, a confirmatory factor analysis was conducted using maximum-likelihood estimation. The model was specified such that the items were constrained to load only on their respective factors, factor intercorrelations were estimated, and covariances between the error terms of the items were constrained to be zero. The model had a moderate fit, that is, comparative fit index (CFI) = .870, root mean square residual (RMRS) = .056, χ^2 (424, N = 528) = 1,833.26, $p < .001$. All of the items had significant standardized loadings greater than .50 on their respective factors. Based on the LaGrange multiplier test (Bentler, 1989), a modified model was specified that allowed three within-factor error terms to covary. The modified model had an acceptable fit, that is, CFI = .905, RMRS = .050, χ^2 (421, N = 528) = 1,256.42, $p < .001$.

To test whether the factor loadings and correlations were invariant across gender, a multisample confirmatory factor analysis was conducted on the total sample. Based on the LaGrange cumulative multivariate tests of the cross-group equality constraints, 1 of the 10 factor correlations and 20 of the 31 factor loadings differed between men and women at $p < .01$. In general, significantly higher factor loadings were obtained for the female sample (M = .74, range = .53−.89) compared with the male sample (M = .67, range = .42−.88). However, all standardized factor loadings were significant and greater than .40 for both men and women. Furthermore, separate analyses found that the confirmatory factor model fit reasonably well for both men and women: female sample: CFI = .909, RMSR = .047, χ^2 (421, N = 630) = 1,546.56, $p < .001$; male sample: CFI = .890, RMRS = .048, χ^2 (421, N = 426) = 1,161.59, $p < .001$.

Table 2 shows the correlation among the five subscales, by gender. All correlations among the five subscales were statistically significant for female and male subjects. To test whether the data fit a second-order general factor of ED symptomatology, a confirmatory factor analysis was conducted in which the first-order factors were specified to load on a single higher-order factor. The second-order model had a significantly better fit than the first-order model, χ^2 (3, N = 528) = 337.65, $p < .001$. The higher-order model had an acceptable fit (CFI = .901) in which all five standardized factor loadings were significant ($p < .001$) and were greater than .30: Drive for Thinness = .78, Bulimia = .83, Body Dissatisfaction = .51, Inappropriate Compensatory Behaviors = .45, and Excessive Exercise = .32.

Internal Consistency

Cronbach's alphas for the EDSQ total scale and five subscales are reported in Table 2. For the female sample, the total EDSQ scale and four of the five subscales had alphas greater than .80; α = .75 for the two-item Excessive Exercise scale. For the male sample, the total

Table 2. Cronbach's alpha, correlations with BMI, and interscale correlations for the EDSQ scales by gender

	Cronbach's *r* With				Interscale Correlations		
Scale	Alpha	BMI	Drive for Thinness	Bulimia	Body Dissatisfaction	Compensatory Behavior	Excessive Exercise
Female sample							
Drive for Thinness	.94	.29	1.00				
Bulimia	.91	**.37**	.60	1.00			
Body Dissatisfaction	.85	**.50**	.58	.40	1.00		
Compensatory behaviors	.81	.22	**.54**	.59	.25	1.00	
Excessive Exercise	.75	ns	.40	.37	.11	**.44**	1.00
Total scale	.95	.39					
Male sample							
Drive for Thinness	.92	.37	1.00				
Bulimia	.83	**.23**	.61	1.00			
Body Dissatisfaction	.75	**.39**	.52	.39	1.00		
Compensatory behaviors	.80	.18	**.39**	.51	.21	1.00	
Excessive Exercise	.72	ns	.33	.26	.13	**.28**	1.00
Total scale	.93	.39					

Note: EDSQ = Eating Disorders Symptoms Questionnaire; BMI = body mass index. All correlations $p < .05$ unless noted otherwise; ns = nonsignificant. Correlations presented in bold are significantly different at $p < .05$ between genders.

scale and three of the five subscales had alphas greater than .80; $\alpha = .75$ for the five-item Body Dissatisfaction subscale and $\alpha = .72$ for the two-item Excessive Exercise scale.

Gender Differences

EDSQ Items and Scales

Female and male participants contrasted on the EDSQ subscales and item means. Significant gender differences were obtained on all five EDSQ subscales. Women had elevated means on Drive for Thinness (3.11 vs. 1.96), t (1,054) = 17.03, $p < .001$; Bulimia (2.67 vs. 1.93), t (1,054) = 8.67, $p < .001$; Body Dissatisfaction (4.25 vs. 2.69), t (1,054) = 20.21, $p < .001$; and Inappropriate Compensatory Behaviors (1.29 vs. 1.10), t (1,054) = 6.68, $p < .001$. Men had elevated means only on the Excessive Exercise subscale (1.39 vs. 1.27), t (1,054) = 2.73, $p < .01$. Significant gender differences were obtained on 29 of the 32 individual ED items. No significant differences were obtained on the following three items: ''I stuff myself with food'' (Item 16), ''I take laxatives to lose weight'' (Item 25), and ''I exercise so much that it interferes with other activities'' (Item 32). The effect sizes between genders for the mean subscale scores as measured by Cohen's d (Cohen, 1988) were large for Body Dissatisfaction ($d = 1.19$) and Drive for Thinness ($d = .88$). Only small effect sizes were obtained for Bulimia, Inappropriate Compensatory Behaviors, and Excessive Exercise ($d = .43$, .32, and .17, respectively).

Eating-Related Symptoms and Weight

Compared with women, men were significantly more likely to report an overeating episode within the past 3 months (28% vs. 14%), χ^2 (1, $N = 1{,}038$) = 28.18, $p < .001$. However, of the 205 participants who reported an overeating episode (117 men, 88 women), only 74 (36%) were confirmed to have had an objective overeating episode based on subsequent coding of the types and amounts of food listed by the participants. The

percentage confirmed did not differ by gender (32% of men vs. 42% of women). Gender comparisons between the 74 overeating cases (37 women and 37 men) were conducted on experiences associated with the overeating episode. Compared with men, women were significantly more likely to feel bad about themselves after overeating (89% vs. 38%), χ^2 $(1, N = 74) = 21.05$, $p < .001$; report a lack of control over eating during the episode (68% vs. 30%), χ^2 $(1, N = 74) = 10.60$, $p < .01$; and report that their eating habits are abnormal (68% vs. 27%), χ^2 $(1, N = 74) = 12.20$, $p < .001$. With respect to averaging at least two overeating episodes per week for the past 3 months, men (32%) did not significantly differ from women (22%). Based on the DSM-IV definition of binge eating (lack of control over eating during the overeating episode), 11 men and 25 women were determined to have experienced a binge eating episode in the past 3 months. The prevalence rate of a binge eating episode for men (2.6%) did not differ significantly from women (4.0%), χ^2 $(1, N = 1{,}038) = 1.48$, $p > .05$.

The correlations between body mass index (BMI; kg/m^2) and the eating behavior scales are presented in Table 2. With the exception of Excessive Exercise, BMI was significantly associated with the EDSQ scales for both men and women. To further examine the association between overeating and the BMI and the EDSQ scales, four eating groups were created: no overeating, subjective overeating (nonconfirmed), objective overeating (confirmed), and binge eating. Separately for women and men, the BMI and EDSQ scale means were contrasted among the four groups using analysis of variance (ANOVA) with Scheffe's post-hoc multiple comparison tests. Significant group differences were obtained for both women and men (Table 3). For women, the binge eating group typically had the most elevated BMI and EDSQ scale scores compared with the nonovereating group, the subjective overeating group was intermediary on most measures, and the objective overeating group only differed from the nonovereating group with respect to the Bulimia subscale (partly due to the small group size, $n = 12$). For men, the binge eating group was elevated compared with the other three groups on Drive for Thinness, Bulimia, Body Dissatisfaction, and the total EDSQ scale. The subjective and objective overeating groups differed from the nonovereating group only with respect to the Bulimia subscale.

Treatment for Eating Problems

On two items regarding treatment for eating problems, women were significantly more likely than men to report ever having wanted treatment (16% vs. 2%), χ^2 $(1, N = 1{,}024) = 47.17$, $p < .001$, and to report ever having been treated for an eating problem (5% vs. 1%), χ^2 $(1, N = 1{,}029) = 18.48$, $p < .001$. These results remained significant after controlling for the EDSQ total scale score and BMI. For both men and women, the EDSQ total scale score was significantly correlated with ever having wanted treatment (male point-biserial $r = .33$, $p < .001$; female point-biserial $r = .42$, $p < .001$) and ever having been treated for an eating problem (male point-biserial $r = .14$, $p < .01$; female point-biserial $r = .17$, $p < .001$). In addition, BMI was significantly correlated with ever having wanted treatment for both genders (male point-biserial $r = .19$, $p < .001$; female point-biserial $r = .32$, $p < .001$), but was not associated with ever having been treated for an eating problem for either gender (male point-biserial $r = .07$, $p > .05$; female point-biserial $r = .02$, $p > .05$).

Association between EDSQ Scales and Other Psychopathology

To assess the association between psychopathology and the EDSQ scales, point-biserial correlations were computed separately for men and women. The following disorders were examined based on a lifetime history at T_3: major depression ($n = 383$), dysthymia ($n =$

Table 3. Overeating group comparisons on body mass index and EDSQ scales by gender

	Group				
	No Overeating	Subjective Overeating	Objective Overeating	Binge Eating	F Statistic
Variable	M (SD)	M (SD)	M (SD)	M (SD)	
Female sample	(N = 526)	(N = 51)	(N = 12)	(N = 25)	(df = 3,610)
Body mass index	25.61_{a} (6.07)	30.32_{b} (9.41)	28.49_{ab} (9.75)	31.98_{b} (10.36)	14.35**
Drive for Thinness	2.98_{a} (1.23)	3.87_{b} (1.49)	3.32_{ab} (1.24)	4.50_{b} (1.05)	18.44**
Bulimia	1.79_{a} (0.70)	2.96_{b} (1.48)	2.86_{b} (1.51)	4.09_{c} (1.18)	89.79**
Body Dissatisfaction	4.15_{a} (1.29)	4.93_{b} (1.07)	3.64_{a} (1.55)	5.36_{b} (0.77)	13.49**
Inappropriate Compensatory Behaviors	1.23_{a} (0.48)	1.71_{b} (1.07)	1.38_{ab} (0.46)	1.85_{b} (0.86)	19.30**
Excessive Exercise	1.23_{a} (0.50)	1.65_{b} (1.15)	1.08_{a} (0.19)	1.56_{ab} (0.88)	9.78**
Total scale	2.41_{a} (0.74)	3.22_{b} (1.11)	2.70_{ab} (0.93)	3.81_{c} (0.71)	39.99**
Male sample	(N = 305)	(N = 80)	(N = 26)	(N = 11)	(df = 3,418)
Body mass index	26.03 (4.23)	25.65 (4.23)	27.74 (6.92)	28.74 (6.04)	2.70*
Drive for Thinness	1.90_{a} (0.80)	1.99_{a} (1.02)	1.93_{a} (0.67)	3.64_{b} (1.17)	15.01**
Bulimia	1.43_{a} (0.49)	1.79_{b} (0.69)	1.89_{b} (0.64)	2.75_{c} (0.89)	29.53**
Body Dissatisfaction	2.62_{a} (1.16)	2.72_{a} (1.16)	2.78_{a} (1.09)	4.11_{b} (1.00)	5.99**
Inappropriate Compensatory Behaviors	1.07 (0.27)	1.18 (0.56)	1.08 (0.27)	1.33 (0.33)	3.63*
Excessive Exercise	1.32 (0.61)	1.54 (0.89)	1.50 (0.87)	1.77 (0.68)	3.65*
Total scale	1.70_{a} (0.51)	1.86_{a} (0.68)	1.83_{a} (0.47)	2.94_{b} (0.68)	19.11**

Note: EDSQ = Eating Disorders Symptoms Questionnaire.
*$p \leq .05$. **$p \leq .001$. Means within the same row with different subscripts differ at $p \leq .05$, based on the Scheffe multiple comparison procedure.

35), bipolar ($n = 20$), anxiety ($n = 150$), alcohol abuse/dependence ($n = 228$), drug abuse/dependence ($n = 163$), and disruptive behavior ($n = 71$). The Drive for Thinness subscale was significantly associated with major depression (female $r = .17, p < .001$; male $r = .20, p < .001$) and anxiety (female $r = .14, p < .01$; male $r = .25, p < .001$). The Bulimia subscale was associated with major depression (female $r = .12, p < .01$; male $r = .29, p < .001$), alcohol abuse/dependence (female $r = .10, p < .05$; male $r = .12, p < .05$), bipolar disorder for women only ($r = .12, p < .05$), and anxiety for men only ($r = .18, p < .01$). Body Dissatisfaction was associated with major depression (female $r = .13, p < .01$; male $r = .12, p < .05$) and anxiety (female $r = .13, p < .01$; male $r = .16, p < .01$) for men and women. The Inappropriate Compensatory Behaviors scale was associated with alcohol ($r = .15, p < .01$) and drug ($r = .12, p < .05$) abuse/dependence for women only and with anxiety for men only ($r = .15, p < .01$). Excessive Exercise was associated with bipolar disorder ($r = .18, p < .001$) and alcohol abuse/dependence ($r = .10, p < .05$) for women only.

DISCUSSION

Our study examined gender differences in ED problematic behaviors and attitudes in a community sample of young adult women and men. The self-report questionnaire (EDSQ) used in this study was designed to measure comprehensively the attitudinal and behavioral symptoms of EDs and it had a similar dimensional structure among men and women, suggesting similar patterns of ED symptom intercorrelations across gender. Consistent with previous factor-analytic studies of the EDI based on female samples (Joiner & Heatherton, 1998; Lee, Lee, Leung, & Yu, 1997; Raciti & Norcross, 1987), we were able to replicate the three main factors that represent the EDI core eating pathology symptom subscales (Drive for Thinness, Bulimia, and Body Dissatisfaction). An advantage of the EDSQ is that it includes additional items to measure inappropriate compensatory behaviors that are integral to the definition of ED in the DSM-IV. It is worth noting that Inappropriate Compensatory Behaviors and Excessive Exercise emerged as separate factors, suggesting that distinguishing between these symptoms and the rest of the ED phenomenology is conceptually justified.

Drive for Thinness, Bulimia, and Inappropriate Compensatory Behaviors had excellent internal reliability for both women and men. Internal reliability of the two-item Excessive Exercise scale was acceptable. Future studies should examine whether the reliability of this scale increases when including additional items. The Body Dissatisfaction subscale had a (nonsignificantly) lower, but still acceptable, reliability for men (.75) than for women (.85). Three of the four items measure dissatisfaction with body areas where women more typically than men bear fat (hips, thighs, buttocks). The significantly lower correlation between Body Dissatisfaction and BMI for men compared with women suggests that the Body Dissatisfaction subscale may be better suited for measuring weight dissatisfaction among women than among men. Future studies need to add questions pertaining to feeling fat that are less weighted toward female fat-bearing body parts. In conclusion, we find that the EDSQ is a useful tool for measuring ED symptoms in both female and male populations.

A second major contribution of our study is the exploration of gender differences in this fairly large community sample in regard to the prevalence of the specific ED symptoms. Women scored higher than men on four of five EDSQ scales, reflecting greater ED symptomatology among women. As predicted, the biggest gender differences both in terms of mean scale scores and the percent of participants who endorsed extreme scores were found on items of the Body Dissatisfaction and Drive for Thinness subscales. Dif-

ferences were smaller on the Bulimia and Inappropriate Compensatory Behaviors scales. On Excessive Exercise, men scored higher than women, but the difference was small. These findings are consistent with our expectation that gender differences would be greatest for AN-related dimensions, somewhat smaller for Bulimia, and that an opposite association would occur for Excessive Exercise. In this general community sample, average scores on Inappropriate Compensatory Behaviors and Excessive Exercise were very low, suggesting that only a small fraction of women and men were engaged in these behaviors during the preceding 3 months. In addition, Excessive Exercise was not associated with adiposity and had relatively weak correlations with the other factors.

Consistent with the results from previous studies (Braun, Sunday, & Halmi, 1994; Casper, 1998; Lau & Alsaker, 2000), we found that the core EDI dimensions, that is, Body Dissatisfaction, Drive for Thinness, and Bulimia (but not Inappropriate Compensatory Behaviors and Excessive Exercise) were associated with a lifetime occurrence of MDD and anxiety disorder for both women and men. Comorbidities of these ED domains with substance use disorders reported in previous studies (Holderness, Brooks-Gunn, & Warren, 1994; Wiseman et al., 1999) were not found for our own sample, perhaps because our sample is young and not yet at the age of maximum risk for substance use disorders. However, significant associations between the Bulimia subscale and alcohol abuse/dependence were found for men and women. Also worth noting is the fact that none of the associations with disruptive behavior attained statistical significance and that bipolar disorder was significantly associated with Bulimia and Excessive Exercise for women only. Pending cross-validation, this latter finding needs to be regarded as tentative.

Consistent with previous studies (Lau & Alsaker, 2000; Leichner, Arnett, Rallo, Srikameswaran, & Vulcano, 1986; Striegel-Moore et al., 2000; Taylor et al., 1998), our results suggest significant associations between BMI and Body Dissatisfaction, Drive for Thinness, Bulimia, and Inappropriate Compensatory Behaviors, but not Excessive Exercise (Table 2). Our findings and those of Kinzl, Traweger, Trefalt, Mangweth, and Biebl (1998) and Leichner et al. (1986) indicate that even at the prediagnosis (subsyndromal) level, there is an association between disordered eating and obesity. The findings suggest that despite body image concerns, drive for thinness, and inappropriate compensatory behaviors, our participants were not succeeding in terms of attaining or maintaining low weight. Given that this finding is based on cross-sectional data, we are unable to disentangle the direction of causation. For example, does Drive for Thinness lead to being overweight or does being overweight lead one to aspire to thinness? Or are they both caused by a third factor? A prospective study may clarify the direction of causality.

In regard to episodes of overeating and binge eating in the past 3 months, several interesting gender effects were found. Using objective criteria for evaluating the amounts consumed during the self-reported overeating episodes, comparable rates of overeating were found for men and women. In addition, rates of recurrent overeating (reporting a minimum average of two overeating episodes per week during the preceding 3 months) did not differ between women and men. However, women were more likely than men to report that overeating was associated with a sense of loss of control, to feel bad about these episodes, and to consider their eating habits abnormal. We hypothesize that female gender role socialization (especially the emphasis on thinness) contributes to the greater risk for women to feel bad about overeating because of its association with weight gain and may explain why women are at relatively greater risk than men for developing BN. The results in Table 3 also support the validity of the DSM definition of a binge eating episode in that the most pathologic scores on the various EDSQ scales and greatest adiposity were always attained by those with a binge eating episode. This pattern held for both men and women.

As expected, our results indicated that with comparable levels of ED problems and obesity, women are more likely to seek help than men. This parallels a previously reported finding for the same sample of greater mental health service utilization for women with comparable levels of depression (Lewinsohn, Rohde, & Seeley, 1998). The female elevation in treatment seeking needs to be understood in the context of relatively small proportions of the total sample that had sought (16% of the women and 2% of the men reported that they had wanted treatment) or received treatment. Only 5% of the women and 1% of the men reported having received treatment. Low rates of treatment for ED in general and the disproportionately low rates of treatment among men compared with women have also been found in other community-based samples (Cachelin et al., 1999; Striegel-Moore et al., 2000) and suggest the need for efforts to educate both individuals with an ED and health services providers about the availability of empirically proven treatments for ED. Our results do not inform about the potential motivational differences between men and women that prompt the desire for treatment and actual treatment seeking. The main finding of greater help seeking for women parallels a previously reported finding for the same sample of greater mental health service utilization for women with comparable levels of depression (Lewinsohn et al., 1998).

Several limitations of our study need to be acknowledged. The age range at the time of the questionnaire was very narrow. Therefore, we cannot examine age-related patterns in ED symptoms and their clinical correlates. The proportion of the sample representing ethnic minority groups is too small for exploring possible variations by ethnic group. The diagnostic information was not measured concurrently with the EDSQ assessment. ED diagnoses and the diagnosis of comorbid mental disorders are based on diagnostic interviews conducted 2 years, on average, before the questionnaire. These limitations are offset by a number of strengths, including the large community-based sample of women and men, the careful and comprehensive assessment of psychiatric diagnoses, the investigator-based assessment of binge eating, and the introduction of a comprehensive self-report questionnaire to measure current ED symptoms.

Based on the encouraging findings regarding construct validity and internal consistency, further research on the psychometric properties (e.g., test–retest reliability, concurrent and predictive validity) of the EDSQ is warranted. The utility of the EDSQ for assessment with different age groups (e.g., preadolescence, adolescence) should be evaluated. The EDSQ makes it possible to measure the full spectrum of ED symptoms and to measure change over time as, for example, in treatment outcome and preventive studies. The EDSQ may be especially useful in longitudinal studies to measure changes as a function of age and gender. In this regard, important questions remain to be addressed: When do the gender differences in ED symptomatology emerge? How do these differences change as a function of age? To better understand the phenomenology of ED, future research should include assessments of male samples.

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